



Transportation Synthesis Report

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Winter Road Condition Reporting for the Public

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Bureau of Highway Operations
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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT technical staff in highway development, construction and operations. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related academic and industry research.

REQUEST FOR REPORT

The Bureau of Highway Operations is interested in improving the systems by which it collects and disseminates weather-related road condition information to the public. The RD&T Program was asked to synthesize current information on this topic, especially including innovative programs employed by other states.

SUMMARY

Effectively communicating with the public about adverse road conditions is of great interest to all states because it impacts both traffic flow and safety. To reach travelers, most states have developed at least some forms of communication including toll-free phone numbers, Web sites, road signage, and radio and television announcements.

This report includes a description of the relatively new national 511 traveler information number and an overview of several states' approaches to reaching the public with weather-related road conditions, primarily through the Internet. Washington state's programs appear to represent the state-of-the-art in automated information acquisition and Internet sophistication. Minnesota uses statewide DOT maintenance staff to enter road information into a system twice daily. Arizona's system provides real-time road condition information about both state highways and local routes. Finally, a few software companies are identified that are working with state DOTs on products for communicating road condition information to the public.

The Federal Highway Administration maintains a very useful site linking to road condition information throughout the country at <http://www.fhwa.dot.gov/trafficinfo/index.htm>. A clickable United States map allows visitors to go to state Web pages containing road condition information. Although much of the information focuses on traffic flow and construction, many states also include weather-specific road condition information on these sites.

511 National Travel Information Phone Number

Over the past decade, more than 300 travel information telephone numbers have sprung up across the country, as a way to deliver the real-time information collected by Intelligent Transportation Systems (ITS) to travelers and commuters to help them with their trip decisions. In 1999 the U.S. Department of Transportation petitioned the Federal Communication Commission (FCC) for a three-digit dialing code to make it easier for consumers to access these travel information services. The FCC assigned "511" to the transportation community on July 21, 2000.

Nearly all implementation issues and schedules have been left to state and local level agencies and telecommunications carriers. Currently six states have active 511 phone systems, and a majority of states and metropolitan areas are expected to have the service by 2005. National leadership is provided by the 511 Deployment Coalition. Led by the American Association of State Highway and Transportation Officials (AASHTO), and including travel information experts from more than 30 organizations, the Coalition has developed voluntary guidelines for state transportation agencies to follow when they plan 511 service for their states or regions. Other leading member organizations of the Coalition include the American Public Transportation Association (APTA), the Intelligent Transportation Society of America (ITS America), and the U.S. Department of Transportation.

The 511 phone number is intended to provide up-to-date information to travelers about a variety of travel-related topics, including current construction, weather-related road conditions, traffic congestion, bus schedules, and much more. The 511 systems already available allow users to access information about specific regions and roadways in a state by pressing numbers on their phone that correspond to menu options. By making a few selections, users receive exactly the information they need for their specific travel plans from a completely automated system.

For detailed information about the 511 Deployment Coalition, the history of 511, current guidelines, and case studies of participating states, visit <http://www.its.dot.gov/511/511.htm>.

ROAD CONDITION INFORMATION PROGRAMS BY STATE

Washington

The Washington State Department of Transportation (WSDOT) provides a sophisticated travel information Web site for the public, which provides real-time data on road conditions, weather forecasting, lane closures and construction, and much more. The data for this site is gathered from numerous sources. A northwest consortium of organizations (including WSDOT's RWIS program, power agencies, an agricultural network, the Department of Natural Resources, the United States Navy and Army, the Environmental Protection Agency, and others) has pooled its information and resources related to weather conditions into a single shared database. The University of Washington's Department of Atmospheric Science acts as the clearinghouse for this information, proofing and verifying it and redistributing it to all participating groups. This process is entirely automated, with information feeds arriving every 15 minutes. WSDOT publishes this information on its Web site for the public to use in making travel decisions.

In addition to the automated data gathered for the site, WSDOT receives information about mountain pass conditions that has been manually entered by road maintenance personnel. This information is integrated with camera footage and forecasts to provide a clear picture of road conditions for travelers. WSDOT also makes use of an Internet-based software application called the Condition Acquisition and Reporting System (CARS), which was developed through a pooled fund research project (with ten other states) by Castle Rock Consulting, to maintain real-time information about travel conditions throughout the state. Users enter data online, which is added to the database of information. Although WSDOT does not use the front-end interface of this application when displaying information to the public, it does take advantage of the back-end functionality. Read more about this system under Minnesota and Castle Rock Consulting below.

WSDOT's travel information Web site for weather-specific road conditions currently has two URLs, depending on the browser version the visitor is using. The original site, called "rWeather" can still be viewed at <http://www.wsdot.wa.gov/rweather>. Users with browsers that support JavaScript and other advanced Internet technologies can visit <http://www.wsdot.wa.gov/traffic/default.htm> to take advantage of additional features. A backend program will automatically detect which browser you are using and direct you to the appropriate site. Both sites feature the same basic information drawn from the same database. The older "rWeather" site will soon be eliminated.

There are a few important things to note while visiting the WSDOT travel information Web site at <http://www.wsdot.wa.gov/traffic/default.htm>:

- Under the "Weather" and "Travel Routes" tabs, there is detailed weather information for specific roadways around the state. This information is added to the site automatically from the WSDOT RWIS system and other automated information sources, as mentioned above.

- Click on “Route Profiles” on the left-hand side when viewing within the “Travel Routes” tab, and you can select one of several main routes from around the state. When you select a single route, you’ll see an impressive three-way display of the route, including camera footage and a two-dimensional view of the road with weather information along the entire path. As a result of sophisticated programming, this page is also completely automated in its ability to receive and display data from its information sources, such as RWIS.
- Finally, under the “Mountain Passes” tab, you can select a single pass on which to view detailed information. When you do, you’ll see very specific road condition information about that pass in red type. This information has been gathered by pass maintenance personnel and entered manually into the database.

WSDOT just launched its 511 phone system as well in September 2002. This phone line takes advantage of the same information that is fed into WSDOT’s Web site, though it currently does not store data on quite as many topics.

The report *Road Weather Information Systems: Enabling Proactive Maintenance Practices in Washington State*, published in March 2002 by the Washington State Transportation Center, WSDOT, and the Federal Highway Administration, is a useful source of information about Washington’s entire “rWeather” program and provides an evaluation of the automation of RWIS technologies. This document can be found at the following link: <http://depts.washington.edu/trac/bulkdisk/pdf/529.1.pdf>.

For more information, contact Larry Senn at 206-543-6741.

Minnesota

Like WSDOT, The Minnesota Department of Transportation (MnDOT) and the Minnesota State Patrol make use of CARS to maintain real-time information about travel conditions throughout the state. However, Minnesota uses the program more extensively. Over 300 users from around the state (including staff from dispatch centers, the field, and the Traffic Management Center) log in to the application daily to enter data they have gathered about road conditions. MnDOT has established guidelines for the type of information that needs to be entered (construction, weather-related problems, incidents, etc.) and how often it needs to be entered (at least twice daily). This information is stored on a remote server that feeds information into the MnDOT travel conditions Web site (<http://www.dot.state.mn.us/winter.html>) and their 511 phone line. The Web site and phone servers query the application server every minute, so that the site and phone are as up-to-date as possible. Both the Web site and the phone line provide information to the traveling public about weather-related road conditions on specific state highways. The system does not include information about rural routes and local roads that are not maintained by MnDOT.

MnDOT is currently looking into ways to automate the data entry process by taking advantage of information gathered from road sensors and weather forecasting. They are working with a group called Meridian Environmental (see below) to consider automation possibilities.

For more information, contact Ginny Crowson at 651-284-3454.

Ohio

The Ohio Department of Transportation maintains a Web site that provides information to the traveling public about road conditions. (<http://www.odotonline.org/otis/>). For general weather-related road information, the Ohio Road and Weather Information System (RWIS) feeds data automatically into the site many times each day. This information is displayed to the public in the form of a clickable state map where people can find out about precipitation, freezing conditions, etc. For snow- and ice-specific information, the site is updated manually by employees all over the state. Each county has designated personnel who enter data that they receive by radio from their snowplow drivers directly into the Web site. There is no specific policy or schedule regarding how often this data should be entered.

ODOT is looking into ways to automate the gathering of snow and ice information for their Web site. Their primary focus is on adding friction sensors to snow plows and other trucks and then transferring the information electronically using global positioning satellites.

The Ohio State Patrol division of the Ohio Department of Public Safety maintains a toll-free number for the public to call to find out about road conditions (1-888-264-7623). Staffers rely on information displayed on the ODOT Web site when talking with the public. The phone line is not automated at all. The news release at the following link about Ohio's Transportation Information System site indicates that the state saved money on the development of the site by developing it entirely in house: <http://www.dot.state.oh.us/news/1999/12-14-99.htm>.

For more information, contact Joel Hunt at 614-466-7173.

Maryland

Maryland offers a comprehensive, advanced traffic management program called the Coordinated Highways Action Response Team (CHART). The Maryland Department of Transportation, along with the Maryland State Highway Administration, Maryland Transportation Authority, Maryland State Police, Federal Highway Administration, University of Maryland Center for Advanced Transportation Technology, and various local governments direct this program. The main "hub" of the system is the Statewide Operations Center (SOC), which operates 24 hours a day, seven days a week with satellite Traffic Operations Centers (TOCs) spread across the state to handle peak traffic. Within this system is an advanced reporting mechanism for the public about weather-related road conditions. The Web site generated by the system provides a clickable map showing road conditions as well as text information about road closures and other hazards. The map is generated automatically from data feeds provided by Maryland's Road Weather Information System (RWIS) and is updated frequently. To view this site, visit the following link: <http://www.chart.state.md.us/mapping/CHARTMap.asp?tab=Emergency&Time=164145>.

CHART also provides other means of communicating with the traveling public, including variable message signs capable of displaying real-time traffic information to motorists, commercial radio and television broadcasts, and the Travelers Advisory Telephone. This phone line currently focuses on summer beach traffic but is planned for possible broader application.

Utah

Commuterlink is an Intelligent Transportation System in Utah that makes use of closed circuit television cameras, electronic variable message signs, traffic signals, ramp meters, traffic speed and volume sensors, pavement sensors, and weather sensors to gather information about state road conditions. The Utah Department of Transportation (UDOT) Traffic Operations Center (TOC) monitors this information and disseminates it to the traveling public via radio, television, and the Internet. The Commuterlink Web site (<http://commuterlink.utah.gov/ie.htm>) refreshes every five minutes with up-to-date information about road conditions.

Information on weather-related road conditions comes primarily from foremen around the state who are responsible for snow removal and road repair. They call a toll-free telephone number and punch in numbers corresponding to road conditions (for example, "1" for dry, "2" for wet, etc.). This data goes directly into the Commuterlink database, which automatically uploads it to the Web site and to Utah's 511 system. The foremen are asked to report on road conditions at least three times each day and are sent automatic reminder e-mails if they have not reported within 24 hours.

For more information, contact Danny Simmons at 801-887-3734 or at dsimmons@utah.gov.

Arizona

Arizona uses the Roadway Closures and Restrictions System (RCRS) to collect statewide information for both local arterial streets and urban/rural highways. Authorized agencies enter data into RCRS through system report screens. This information is forwarded to a central repository computer where it is archived and shared with each agency and made available to the public within five minutes via a Web site (<http://www.azfms.com/HCRS/hcrs.html>), a toll-free phone number operated by their voice remote access system (VRAS), and information kiosks at public venues. Arizona launched a 511 number, which currently directs people through their VRAS for information about road conditions. Arizona appears to be unique in its ability to provide real-time road condition information to the public about both state highways and local routes.

For a complete case study on Arizona's 511 system and how the information is gathered from RCRS for both the Web site and phone system, refer to the following document from February 2001: <http://www.its.dot.gov/511/PDF/Arizona.pdf>. Per this document, you can contact Tim Wolfe at 602-712-6622 for more information about Arizona's 511 system and RCRS, including how other public agencies can obtain a free license for Arizona's RCRS software.

Oregon

The Oregon Department of Transportation and the Oregon State Police work together to update the TripCheck Web site (<http://www.tripcheck.com>), which provides all kinds of information for travelers. One section of the site is devoted entirely to winter weather road conditions and allows users to select a region or city of the state to view as a clickable map for detailed information, camera footage, and weather forecasts. Road condition information is entered directly into TripCheck from ODOT offices around the state. An ODOT-developed software package, the Highway Travel Condition Reporting System (HTCRS), collects the data and delivers it to the Web. The site only reports on conditions in the state's highway system.

Oregon also offers a toll-free number (1-800-977-6368) for information about road conditions. This is an automated line that uses the same data as the TripCheck Web site.

SOFTWARE COMPANIES

Meridian Environmental

<http://meridian-enviro.com/>

Meridian offers a complete decision support package specifically tailored for transportation professionals and their customers, commercial truckers, fleet managers, and the traveling public. Incorporating 21st century weather forecasting methods with state-of-the-art communications technologies into a single decision support package, the [ATWIS™](#) suite of weather forecasting products and services delivers custom, site-specific weather forecasts conveniently over the Internet. Public travelers can benefit from free weather reports delivered over cellular phone through Meridian's [#SAFE™](#) (pronounced "pound-safe") service.

Nebraska, South Dakota, and several other states use the #SAFE technology for their travel information Web sites. The Nebraska site address is <http://www.safetravelusa.com/process.pl?state=ne>.

For a list and description of all of Meridian Environmental's transportation products, visit <http://meridian-enviro.com/products/trans.html>.

Castle Rock Consulting

<http://www.crc-corp.com/index.htm>

Castle Rock Consulting develops road weather information systems, traveler information systems, and more, often for multiple states at once. They've created voice response 511, automated Web page displays, pager systems, e-mail, and radio bulletins that work together as an integrated system. Both Washington and Minnesota take advantage of Castle Rock's CARS technology.